

are engaged in daily practice and experiment with the gun, and who are bound to report to Government their experience of it, are so deluded and so infatuated as to concur in foisting an inefficient weapon on the country.

I am, Sir,

Your obedient Servant,

W. G. ARMSTRONG.

London,

25 November 1861.

THE ARMSTRONG GUNS.

LETTER

FROM

SIR W. G. ARMSTRONG

TO

THE "TIMES,"

DATED 25 NOVEMBER 1861.

24/6/16

THE

ARMSTRONG GUNS.

TO THE EDITOR OF THE "TIMES."

SIR,

I ENDED a letter which I had the honour of addressing to you last month by declining further controversy on the subject of the new system of ordnance. My time is too much limited to permit of my involving myself needlessly in controversial warfare, and it is not reasonable to expect that I should continually have to defend my gun in the columns of the Press, through all the stages of its progress and development, against incessant attacks by opponents usually ill-informed as to their facts. In the long run the best weapon must win the day, whether it be mine or another's, and I am as sure that my gun cannot be written up into success, as I am that if successful, it will never be written down.

On reconsideration, however, I think it possible that my refusal to engage in controversy may have been misconstrued. The public are not in the same position as I am. They have not the means of knowing those broad facts which are known to Government and myself, and they have a right to be anxious on a matter so intimately concerning public expenditure and national defence. Before retiring from a discussion of the subject, I will therefore let your readers know all that I can tell them on points lately raised, and they shall judge for themselves. A brief statement and

Committee. At the third round the six inches of muzzle fell off, but the practice was not stopped, and as the gun shoots as well as ever, the Committee have retained it for other experiments.

II. I now come to the statistics regarding the vent-pieces.

Before entering on this branch of my subject, I may remark generally that the vent-piece is not expected to have the same durability as the gun. It is separate from the gun, and contains the vent or touch-hole, which is the most perishable part of all ordnance. Every time the weapon is loaded the vent-piece is removed; two of them are attached to each gun, and if one is injured by casualty or wear of the vent, the other is ready to replace it. A list of injured vent pieces is, therefore, not a list of accidents. The list below comprises not merely broken vent-pieces—indeed a wrought-iron vent-piece has never yet been known to break—it is made up of vent-pieces worn in long and honourable service, as well as of those broken, bulged, cracked, flawed, or rendered unserviceable in any other way. At the same time I can afford to confess that I have had some difficulty in determining the material and pattern of the vent-pieces for my larger guns. I too hastily deferred to the general preference for steel over iron, and have since learnt, by vexatious experience, the uncertainty and unfitness of that metal, as now manufactured, for purposes of the kind. It will be seen by the Table below that the injuries there entered have chiefly occurred to steel. Where otherwise, they have been confined, with one exception, to the 40-pounder; a proof that the fault was one of pattern and not of principle. I have, therefore, for some time been occupied in settling a stronger pattern for the 40-pounder vent-piece, and as it is precisely one of those questions which presents no radical difficulty to an engineer, I think the public may safely leave the matter with the authorities and myself.

Vent-Pieces.

Calibre of Gun.	Number Issued. (Two to each Gun Issued.)	Number blown away.	Number rendered Unserviceable.	
			Steel.	Iron.
6-pounder	10	2	0	0
12-pounder	621	2	8	0
25-pounder	141	0	3	0
40-pounder	346	1	9	7
100-pounder	468	0	4	1
Total	1,492	5	24	8

A few remarks are necessary as to this table, which, like the first, extends over the whole existence of the gun in the service.

First, as to the vent-pieces "blown away."

I have taken their number from the official report ordered by the Director of Ordnance, and dated the 14th instant. The report itself concludes as follows: "There may be more" (*i. e.* cases of vent-pieces blown away), "but as they *always arise from carelessness*, the facts may not have been noted." Some few other cases, indeed, as I myself know, have occurred—chiefly during practice by recruits. From the reason above suggested, they seem never to have been forwarded to the Government, and I have not included them in the list. The two 12-pounder vent-pieces entered above are those reported to have been blown away in China on August 11, and September 2, 1860. This number has been doubled in the imagination of Captain Halsted. Two casualties which happened on board the "Excellent," and were at the time described as of this nature, were not instances of vent-pieces being blown out, but of the handles being blown off from neglect in screwing up the breech.

The truth is, that no vent-piece ever would have been blown away had the gunners known their drill from the first. The accidents arose simply from the neglect of uninstructed gunners to drop the vent-piece fairly to the bottom of the slot. A wider knowledge of drill seems almost to have put an end to the occurrence, and as an additional safeguard, all the vent-pieces lately made have been furnished with a slight projection, by which the accident is rendered almost, if not altogether, impossible.

I take next the vent-pieces registered above as unserviceable.

I have already remarked that the principle of steel having been definitively abandoned, instances of injuries to steel are of minor importance. But even the number of steel failures entered by me above must be taken with much reservation. Six of the 12-pounder vent-pieces, for instance, under this head, failed at Shoeburyness where from twenty-one 12-pounders, 12,433 rounds have been fired. The other two are reported by the Marine Artillery, who have fired I don't know how many rounds. The three 25-pounder vent-pieces failed during experiments. Of the nine steel 40-pounders, four went in some experiments on board the "Trusty," to which I shall presently refer. Two others became unserviceable in the course of 2,001 rounds from 40-pounder guns at Shoeburyness; one more failed on board the "Cambridge" in the course of 1,003 rounds from 40-pounders; one on board the "Cochin" gun-boat, and the remaining one on board the "Edgar" flagship of the Channel Fleet during a number of rounds unknown to me. I have only now to account for the four steel 100-pounder vent-pieces. These all failed at Shoeburyness in the course of 1,172 rounds, but two of them yielded only to extra charges of 18 lb. of powder.

As to the failures of the wrought iron vent-pieces. In the case of the 100-pounders, they are limited to the single instance of a vent-piece slightly bulged, which had not been reported when I last addressed you. Beyond this we have

but seven to account for. As I have above said, all these seven occurred to one class of gun, whose pattern of vent-piece will in consequence now be changed. But what is more remarkable—all these seven (together with the four vent-pieces mentioned above) failed on board the "Trusty," in the course of a single experiment with Captain Cole's cupola shield, during only 142 rounds from only two guns. The gun in which eight of the eleven vent-pieces thus failed was brought to Woolwich for investigation. It there exhibited none of the destructive qualities it had shown on board the "Trusty," but was fired 58 rounds with the same pattern vent-piece as before, yet could make no impression on it. Failures so singularly localised can only have arisen from some special cause. At the same time the strengthened pattern will meet even such contingencies as these.

It only remains for me to add two more casualties, which, as they happened during an experiment at Woolwich, by the Ordnance Select Committee, for testing a carriage, are not included in the Report. On that occasion one steel 40-pounder vent-piece was broken, and one of wrought iron cracked. During the same experiment the copper ring of two vent-pieces became loosened; an injury quickly remedied by pressing on a new one, and having nothing to do with the strength of the vent-piece. No other failure has occurred to the service patterns, even during experimental practice.

The above statistics are taken from official reports before me, from the Horseguards and Admiralty, dated respectively the 7th and 14th instant. My extracts as to vent-pieces, broken or injured, would, however, be incomplete if I did not carry my information farther. No failure of this kind has ever taken place at any artillery station except Shoeburyness. None is reported from Shorncliffe, where there is constant practice, nor from any of our 36 batteries of field artillery, at home or abroad. None has occurred in New Zealand. None happened in China during 3,800 rounds. None in the Channel Fleet, in all the rounds they must have fired, except one steel 40-pounder vent-piece on board the "Edgar." None

on board the "Excellent," gunnery ship, and her tender, in 2,455 rounds. None on board the "Cambridge," gunnery ship, and her tender, except one steel 40-pounder, in 3,523 rounds. These facts speak for themselves. Casualties to some extent necessarily attend a new system on its introduction, and their number will naturally every day grow less.

The above account, which takes in a period of nearly three years, is drawn from authoritative reports framed by Government servants, and I have added all that my own knowledge supplies. Rare as have been the cases in which the success of the gun has not been complete, I take more pleasure still in the fact, that a new system of rifled artillery, with its new projectiles, fuses, and accessories, has been introduced, and so far perfected without loss of either life or limb, or even injury to a single individual. The truth is, that the guns are of unprecedented strength. Your readers will be interested in an account of some official tests of endurance to which one 100-pounder, two 40-pounders, and two 12-pounders not long ago were submitted. The facts have been in some measure made public, but will, I think, bear repetition.

The 100-pounder (weighing only 81 cwt.) was fired one hundred consecutive rounds, with the full-service charge of 14 lb. The projectile for the first ten rounds was of 100 lb. weight, and was increased by 100 lb. every ten rounds after; so that from the ninth to the hundredth round it weighed 1,000 lbs., and projected two feet from the muzzle. The gun, after sustaining this extraordinary test without injury, might have been merely passed into the service, but was taken for the severe duty of proving vent-pieces, and daily endures a repetition of full-proof or double-service charges of 28 lb.

The two 40-pounders (weighing 32 cwt. each) were loaded with full-service charges of 5 lb., and fired like the 100-pounder, for one hundred consecutive rounds. In the first instance the projectile was 40 lb., and it increased in the same manner every ten rounds up to 400 lb. Both guns remained uninjured; and at the close of the experiment it was deter-

mined to try one of them still further. It was fired for thirty more consecutive rounds, but this time with double charges of 10 lb. The projectile ranged as before, between 40 lb. and 400 lb., every third round receiving an additional 40 lb. in weight. These two guns, like the former one, are uninjured, and are still, for all I know, in regular use.

The two 12-pounders have nearly the same story to tell. I will not, therefore, weary you with the details at length; both withstood the hundred consecutive rounds, with proportionately increasing projectiles and full service charges of 14 lb. Both were submitted to the double proof charges of thirty rounds more. One remained perfectly serviceable and sound; the other failed near the muzzle, after the sixth increase in weight of the projectile, that is to say, after throwing a cylinder of 84 lb. with double the service charge. But I must observe, that in choosing these two 12-pounders for this ordeal, one was purposely selected which had actually been rejected at proof as defective; and it was this defective one which finally succumbed to the treatment I have described.

But after all, special experiments of endurance are hardly of more value than the general experience gained in ordinary use. I select from the list before me some returns of the number of rounds fired by individual guns which are still in constant practice. Of heavy guns, I see that one 40-pounder has fired 721 rounds; another 571. Of the 12-pounders, one has fired 1,720 rounds; another 1,832; another 2,817 rounds. Even my original experimental 18-pounder gun, submitted to the Government in the year 1857, has fired between 2,000 and 3,000 rounds, and is still in perfect condition. Nor need I remind the public, that this ordnance has been tried against every kind of object, comprising ships, forts, earthworks, martello towers, and targets representing bodies of troops, with an effect never attained by any other system. Its complete success in China was recorded by your own correspondent, and authoritatively pronounced by Ministers in Parliament. Add to this, that the experience

of the gun has been of a very complicated kind. I do not know whether your readers are aware that I had to introduce with the gun an entirely new system of fuses and projectiles.

First. A time fuse, which burns during flight, and which can be set so as to explode the shell at any given number of yards, or as case-shot at the gun's mouth.

Second. A percussion fuse which is incapable, in its original state, of exploding the shell though dropped from a great height, but which acquires, by the act of firing, so delicate a sensibility, that it explodes the shell thenceforward at the slightest touch.

Third. The sea-service percussion fuse, which, like the last-mentioned, has no sensibility before it is fired, never has sufficient sensibility to explode the shell by impact on the water or by ricochet; but takes effect on a ship's side, whether it strike it point foremost or otherwise, and bursts the shell in the very act of passing through the timber.

Fourth. The solid shot for battering: the common shell for explosive effect, and the segment shell for use against troops or the crews of ships:—three projectiles, the destructive power of two of which is on a scale hitherto unknown.

Each of my field service projectiles contains the first and second of these fuses. A slight adjustment only is required at the very moment of loading to determine whether it shall act as solid shot, shrapnell shell, case-shot, or percussion shell. Each battery of field artillery under this system goes into action not merely with a gun of less weight than formerly, and using half the weight of powder, but, what is more important, carrying many kinds of shot in one. Surely then I have a right to say that our experience of the gun, in all its varieties of size and with all its accessories, ranges over a field so wide that greater hindrances and more mischances might reasonably have been looked for than have actually occurred.

After the ample statistics I have given I might close my letter here, but I will first shortly notice some strictures

on my guns which have lately appeared in the public newspapers, and, as I prefer an opponent, however uncompromising, who has the manliness to avow his name, Captain Halsted shall have the precedence.

Captain Halsted commences a letter, which lately appeared in your columns, by instancing four large guns which, he says, successively broke down after a very few rounds; and he impugns generally the safety and endurance of the guns made on my principle.

I might oppose to such a conclusion the clear proofs to the contrary, which I have given above, but I will meet his examples specifically. He refers, in the first place, to an 80-pounder gun, the first heavy gun I made, and only an experimental one. He says it was used against the "Trusty" in 1859, and had a defect in the interior. I answer, that it had no defect which in the slightest degree affected either its safety or efficiency. The slight flaw of which Captain Halsted speaks, was readily cut out, without damaging the gun. It was one of the four guns subsequently used against the Martello Tower, at Eastbourne, and has been employed on various occasions since.

His three remaining examples are 100-pounders, which he asserts were successively disabled on board the "Stork," gunboat, and condemned as "dangerously defective," after firing an insignificant number of rounds. I reply, that two of these 100-pounder guns were returned, not as condemned, but only for examination and report. After such examination they were declared fit for use, and one of them was sent to Shoeburyness for continued firing. It there fired 363 rounds, and was then forwarded to Woolwich, where, to remove all doubt of its safety, it was proved a second time, and then returned to Shoeburyness for general use. Captain Halsted, who admits the fact of the gun being subsequently used at Shoeburyness, qualifies the admission by saying that it was there only considered as "capable of cautious use." So far from this being the case, it was indiscriminately employed for firing shot of 200 lb. weight

against experimental iron targets. The second 100-pounder, which was precisely in the same condition as the former, and whose character might have been re-established in the same way, underwent a different treatment. Advantage was taken of the existence of the flaw to test the efficacy of a brass lining introduced into its powder chamber, after which it fired 50 rounds with extra charges of 18 lbs., and remains perfectly serviceable. I feel it necessary here to remark that from the novelty of these guns they were naturally and very properly regarded in the first instance with a degree of suspicion approaching to timidity, and the slightest indication of flaw became an object of apprehension. Captain Hewlett, the commanding officer of the "Excellent" gunnery ship to which the "Stork" is attached, in a letter which I have recently received, says that had he known the guns at first as well as he does now, he would not have deemed it necessary to exchange the couple of guns last mentioned. He adds: "We knew very little about the guns at first, and were startled at the slightest appearance of flaw." The third 100-pounder referred to by Captain Halsted is still on board the "Stork." It has been ordered to Woolwich for examination, but until it has arrived and been tested, I shall not suppose it to be a solitary instance of "dangerous defect," but take it on trust that its flaw will prove as little important as those of the other two.

But there is yet a very important remark to make on these guns. The fact is, that the particular 100-pounders referred to by Captain Halsted are part of a batch of guns which were not made purely on my principle. Before the difficulties of manufacture of the heavy guns were fully mastered, and during the first pressure of the demand for them, I was compelled for a time to make the inner tube—contrary to my principle—from a solid forging instead of from coiled iron, and the result has proved the inferiority of the plan. But this circumstance, instead of being an argument against my mode of construction, only proves its superiority over the alternative system of making wrought-iron guns

out of solid blocks of that material. The manufacturing difficulties, I am happy to say, have been for some time past overcome; and, all the more recent guns being on the coil principle throughout, are not liable to those defects which, in the instances named, have excited suspicion.

Captain Halsted asserts, that "up to the present time the 100-pounder gun has never been subjected to any representation of real action by fifty consecutive rounds of rapid fire." This is incorrect. All descriptions of my guns have been fired fifty rounds at a time continuously, with various degrees of rapidity.

Captain Halsted next remarks on the liability of the guns "to choke up their shallow grooves with the lead covering of their missiles." He is quite wrong in supposing that in any case the grooves become choked with lead. He would have been justified in saying that in cases where the guns are neither sponged nor properly lubricated the grooves will become clogged with a deposit from the powder. But this never happens when an efficient lubricator is used, such as that recently produced by Colonel Boxer. With that lubricator 50 rounds at a time have been repeatedly fired without any sponging, and the gun has remained as clear in the grooves at the end of the experiment as after the first round.

With regard to the failure of the vent-pieces on board the "Trusty," which, of course, forms a prominent part of Captain Halsted's remarks, I refer to the detailed particulars which are given in the early part of this letter. The "breaking down" of the naval 40-pounders, to which he alludes, was nothing more than the necessity which arose for twice replacing the copper ring at the breech, injured by the breaking of the vent-pieces.

Shot, shell and fuses for the guns Captain Halsted condemns *en masse* as "delicate and complicated chemical and mechanical compounds," and then proceeds as follows:—"At the second shot fired at the "Trusty" on the 28th

vent-piece of the naval 100-pounder, two men must stand upon the gun-carriage in so elevated a position as to be wholly exposed to rifle aim." This is not the case; by passing a staff through the rings of the vent-piece, it is easily lifted by the men while standing on the level of the deck.

I now arrive at his summary of "inherent defects," which I shall very quickly dispose of.

First, he says "the gun cannot be loaded at the muzzle." I might as reasonably object to a muzzle-loading gun, that it cannot be loaded at the breech; if, however, it be an object, which I do not concede, to have the alternative of loading at the muzzle, I need only rifle my breech-loader on my shunt system, and it becomes a muzzle-loader also. The gun which fired the other day 51 rounds at the rate of one round in 26 seconds, was a gun of that kind.

He next says, "the gun cannot be double shotted." There is not the least difficulty in using two flat-ended shot; but why should this be done when a single percussion shell would be ten times more effective?

Thirdly, he says the gun cannot throw an incendiary (Martin's) shell. Here he is utterly wrong, for even the lead-covered shell, to say nothing of the ribbed one, has been successfully fired with molten iron in both 40-pounders and 100-pounders; in fact, targets are at present being built for a continuance of the practice.

Fourthly, he alleges that the gun "cannot be used with reduced charges for fear of the effects of air space." If Captain Halsted had attended the ricochet firing at Woolwich, he would have seen all sizes of my guns, from 40-pounders downwards, used with every variety of charge, from a few ounces up to the full service quantity.

Fifthly, he declares that "within certain limits of distance the gun cannot be used to cover either troops or boats with shot or shell, for fear of the lead which strips from all the projectiles, as proved on service in China, and as openly admitted by the author himself in May last." Really I thought that on the occasion to which Captain Halsted

September 1859" (he being present), "the right rear man at the gun was blown down by explosion from the plug aperture of the breech, which, in that first gun, was at the side. He was picked up scorched, the hair of his face burnt off, and his sight temporarily injured." Now why cannot the simple truth be told, which is, that a man standing near the side aperture of the breech had his whiskers and serge frock singed. The blowing down and picking up are dramatic ornaments which I shall charitably ascribe to the same decorative style of writing that "nearly killed" Captain Hodson at Shoburness. I was a close observer of what took place, and Captain Sir William Wiseman and Captain Hewlett, who were also present, and to whom I have applied, confirm the accuracy of my statement. For my part I was as much alive as Captain Halsted could be to the objection of this lateral escape of gas at the breech; and I may inform Captain Halsted that this very experimental gun, which he takes up again after two years, to swell his condemnation of service guns, was the precursor of one in which all the defects of the original were removed, and whose extraordinary rapidity of firing was chronicled in your columns about a fortnight ago.

Captain Halsted indeed goes on to say, that "to this day the 100-pounder delivers its rear explosion with the same force as then." This would doubtless have been so, had I treated the case with his impatience; but notwithstanding his assertion, I am enabled to say that by the use of cups, or saucers as he facetiously terms them, the escape of gas is completely arrested in these large guns. Recent experiments at Shoburness have shown that pieces of white paper may be laid close up to the joint without exhibiting any stain of powder smoke. It was while waiting the result of experiments on this subject that I was lately induced to apply to Sir George Lewis to suspend for a short time the issue of the 100-pounder guns.

Captain Halsted next states, that "in order to lift in the

calculated to mislead the uninformed. He oracularly pronounces "radical" or "inherent" the defects he attributes to the gun; yet he suggests no substitute for what he condemns, and offers no new idea to aid the solution of a problem in which all are interested. But there are some objections—by far the most loudly and persistently repeated—which come from more disingenuous assailants. Statements absolutely false, contradicted officially by Ministers in Parliament, and by myself, as author of the gun, are adduced again and again, whenever the refutation is likely either not to have been seen or to have been forgotten. For instance, despite the most authoritative denials, it is asserted and re-asserted that the guns failed in China, and that casualties occurred from the stripping of the lead. One paper, the *Mechanics' Magazine*, into whose motives for continual misrepresentation I do not trouble myself to inquire, on the 1st of March last actually presented its readers with an imaginary summary (pointed with marks of quotation) of a "confidential despatch" sent home by Major Hay, in which the gun was said to have been spoken of in condemnatory terms, to have been withdrawn from action at a critical moment, and to have occasioned casualties to our own men. It further informed its readers, not for the first time, that the average cost of the guns was 2,000*l*. Mr. Baring, Under Secretary for War, gave a flat denial to all these statements from his place in Parliament on the 14th of March last. "No casualties occurred" in China; and Major Hay's report was of a directly opposite nature. "The gun," says Major Hay, "was the admiration of all." Mr. Baring further told the House, that the price of the 12-pounder and 40-pounder Armstrong guns was 120*l*. and 285*l*. respectively. In spite of all these rebuffs—in spite of Lord Herbert's declaration, founded on the China despatches, that "we had the best gun in the world"—in spite of the testimony to its efficiency and value given on every public occasion by the Commander-in-Chief of the expedition—in spite of Major Hay's published letter

so strangely refers, I had succeeded in showing the hollowness and absurdity of this objection. I stated that the lead could be, and had been so absolutely fixed to the projectile as to render separation impossible. I produced specimens of shells both exploded and entire, in proof of this. I showed that the military authorities had had their choice whether the lead should be thus absolutely fixed, or be in some degree separable, so as to produce more fragments on the bursting of the shell. They have made their choice, and I presume that they are the best judges of what are the requirements of the service. If Captain Halsted can persuade them that they have chosen wrong, it is open to them to modify their decision in any way they please; but as they have been offered any degree of adhesion, I do not see how I can be responsible for their decision, though I believe they have decided rightly.

I think I have now answered every point advanced in Captain Halsted's letter, and have only to direct the attention of your readers to the spirit in which that and other attacks on the gun have been written. It is singular to be placed in a position where not only facts are invented by my assailants against me, but my own inventions are turned against me too. I find myself suddenly reproached with improvements. Finality is a word which ought to be unknown to practical science, and yet I am condemned to the prospect of seeing every future invention I may make in the service of the country treated as a condemnation by myself of its precursors. It actually seems to be the object of some antagonists to prevent me from working at all. Captain Halsted himself does not write as a critic, but as a downright uncompromising opponent. He acknowledges no one advantage in my system. The lightness of the guns, their precision of fire, their length of range, the extraordinary power of the shell in its different forms, as shown against every variety of object, are all passed over in silence, while every appearance of failure (experimental or otherwise) is exaggerated and dressed up in highly coloured language,

to myself, which I subjoin,* the *Mechanics' Magazine* insinuated, and still insinuates, that the Government "suppressed" the truth; that Major Hay's despatch had been written in the sense they had affirmed, and that Government influence was used to prevent China Officers from speaking. In their number of the 18th ultimo I find this extraordinary statement, the disingenuousness of which is quite monstrous:—"Mr. Baring, the Under Secretary for War, in his elaborate speech on the War Estimates, showed that each Armstrong gun had cost on an average 2,160 £, thus proving that we were sufficiently guarded in our statements." I feel slow to impute animus to anybody, far less to a journal which represents mechanicians; but I am compelled to speak strongly about misstatements so deliberate and so repeated.

From such attacks as these I appeal to common sense.

* Letter from Major R. J. HAY, R.A., to Sir W. G. ARMSTRONG, & Co.

Dear Sir William,
2, Coates Crescent, Edinburgh,
22th March 1861.

It was not my intention to have taken any notice of the article which appeared in the *Mechanics' Magazine* of the 1st March, headed "The Armstrong Gun," it being so utterly at variance with the substance of my actual reports.

But my attention having been called to an article in the "Morning Post" (22d March), copied from the *Mechanics' Magazine* of the previous week, commenting on the speech made by Mr. Baring when laying the Army Estimates before the House, in which the writer in the boldest way challenges the production of my report to substantiate, I imagine, his former statement, I am induced to write to you, in order that you may, should you deem it necessary, contradict in any way the statements contained in those articles.

The Armstrong Guns in China rendered the most valuable service, being always in the most efficient and serviceable condition, although put to very severe tests. They were never withdrawn from action and their places supplied by others; on the contrary, the Armstrong Guns were invariably the first to be ordered up when artillery was required. At Tongchow, on the 14th August, and again on the 21st, at the capture of the Upper North Taku Fort, the Armstrong batteries were firing over

Vague and groundless insinuations, thrown out by random writers, who may, for anything I know, be unscrupulous as well as misinformed, should not be allowed to excite public alarm. It is said that there ought to be a Committee of Inquiry. I can have no objection, though no *prima facie* case against the gun exists at all. But let it be remembered, that a Committee of Inquiry is and always has been sitting on my gun. The Committee appointed by Government to superintend and control all matters relating to Ordnance, have their attention continually devoted to it in every detail. All the facts I have mentioned above are known to them. Supposing, then, that I were dishonest enough to wish to conceal anything from the public—supposing that two successive Governments, and their Ministers at War, were weak enough to have been throughout misled,—surely no one in his senses will believe that the Ordnance Select Committee, and the many scientific officers, who

the heads of our infantry in advance, and the guns never ceased firing in consequence of any casualty to our men, quite the reverse, those guns continued firing whilst the infantry advanced to storm the enemy's works. It would have been most surprising if slight alterations had not suggested themselves in both guns and ammunition, considering that they were being tried for the first time, and that they were most jealously watched by all.

In fact, from the instructions I received before leaving England, it was my duty to point out the slightest defect; this I did, and I was glad to observe, in a recent visit to the Royal Arsenal, Woolwich, that those defects had all been remedied in a manner which experiments had proved to be most successful; and I now feel confident that the British artillery have the first gun with the most perfect ammunition in the world.

I am,

Yours very faithfully,

R. J. HAY, Bt. Major Royl. Artyr,
late Asst. Adj't. Genl. Rl. Arty. Expedy. Korea, China.

Sir W. G. Armstrong, & Co.,
&c. &c.